PHYSICS OF THE BI-PARTITION OF THE UNIVERSE

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Using already tested physics of matter-antimatter interaction, an attempt is made of a check of the bi-partition model of the Universe of Fliche, Souriau and Triay (1982b). No inconsistency is found.

Fliche, Souriau and Triay (1982b) have considered an expanding closed Universe with:

$$dt = (hH_0)^{-1} A^{-1/2} R\, dR, \quad A = \Lambda R^4 - K R^2 + \Omega R$$

$$\Lambda = 1 + K - \Omega, \quad \Omega = 0.06 \pm 0.01, \quad K = 0.20 \pm 0.01$$

suggesting a bi-partition of the Universe, half matter and half anti-matter, separated by a zone of absence of QSOs. Schatzman (1982) has tested the model with respect to the following points: i) Delay of recombination due to gamma-ray production at the interface. Recombination takes place for $z \simeq 600$ at the interface; ii) Thickness of the region where ionization excess prevents recombination from taking place. When $z = 1200$, the thickness of the ionized region measured at $z = 0$ is about 100 megaparsecs, in agreement with the estimate of Fliche et al. (1982a); iii) Production of gamma rays above 35 Mev at Earth. The result of Fichtel et al. (1978), $5.7 \cdot 10^{-5}$ photons cm^{-2} sr^{-1} s^{-1} can be interpreted by the present annihilation of matter and antimatter along the zone of absence of QSOs (from $z = 0.9$, $\alpha = 17^h 44^m$, $\sigma = -5°55$ to $z = 30$ [at the opposite pole] [extrapolated]), the fit between observations and model being obtained for $\Omega h^2 = 0.1$, which is the right order of magnitude

Bibliography

Fichtel, C.E., Simpson, G.A., Thomson, D.J. 1978, Ap. J., 222, 833.
Fliche, H.H., Souriau, J.M., Triay, R. 1982a, Astron. Astrophys., 108, 256.
_____ 1982b, preprint.
Schatzman, E. 1982, Cours à l'Ecole de Goutelas, preprint.

Discussion

Cristiani: Do you expect any effect on spectra of QSOs at larger red-
               shifts, say, any particular kind of absorption lines?

Schatzman: The missing zone has been found by Fliche et al. by con-
               densing large clouds which define it. As far as I remem-
ber, they are visible through absorption lines.